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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/594,839	06/15/2000	James Anthony	2629-4017	3097

7590 10/17/2002

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EXAMINER
CHUNDURU, SURYAPRABHA

ART UNIT	PAPER NUMBER
1637	18

DATE MAILED: 10/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/594,839	ANTHONY ET AL.	
	Examiner	Art Unit	
	Suryaprabha Chunduru	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 July 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disp sition of Claims

4)☒ Claim(s) *1-55* is/are pending in the application.

4a) Of the above claim(s) *47* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-46 and 48-55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Pri rity under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. Applicants' response to the office action and amendment (Paper No. 15) filed on July 9, 2002 has been entered.

2. The Information Disclosure Statement (Paper No. 16) filed on July 30, 2002 has been entered.

Response to Arguments

3. Applicant's response to the office action (Paper No.15) is fully considered and deemed persuasive.

4. With respect to the rejection made in the previous office action under 35 U.S.C. 112, second paragraph, applicants' amendment and arguments have been considered and the rejection is withdrawn herein.

5. With respect to the rejection made in the previous office action under 35 U.S.C. 103(a), Applicant's arguments with respect to claims 1-6, 10-12, 15-26, 30-38, 40-46, 48, 50-51, and 53-55 have been considered but are moot in view of the new ground(s) of rejection.

6. The following is the rejection made in the previous office action under 35 U.S.C. 102(b):

Claims 22-27, 30-36, and 40-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Snitman et al. (USPN. 5,641,630).

Snitman et al. teach a method of detecting a target nucleic acid wherein Snitman et al. disclose that the method comprises hybridizing a nucleic acid target (double or single stranded) with a first probe (capture probe) and a second probe (signal probe) to which a reporter moiety is attached, forming a hybrid (DNA-DNA or RNA-RNA or DNA-RNA, and detecting the hybrid complex by binding an antibody which recognizes the hybrid (see column 5, lines 43-67, column 6, lines 1-6). Snitman et al. also teach (i) modifying capture probe with a ligand (see column 5,

line 67, and column 6, lines 1-60); (ii) signal probe could be unlabeled (see column 6, lines 46-51); (iii) capture probe could be biotinylated (see column 6, lines 1-17); comprises single-stranded target DNA (see column 5, lines 43-62); hybrid could be captured onto a solid support (see column 7, lines 1-8); antibody could be labeled with alkaline phosphatase (see column 6, lines 52-67). Thus the disclosure of Snitman et al. meets the limitations in the instant claims.

Response to the arguments:

Applicants' arguments with respect to the rejection made under 35 U.S.C. 102(b) claims 22-27, 30-36, and 40-45 have been considered and are found not persuasive. Applicants argue that the prior art of the record (Snitman et al.) labeled or modified probe and hence the Examiner's statement that 'signal probe could be labeled' does not support the limitation that signal probe is unlabelled in the instant claims 25 and 40. This argument is unavailing for two reasons. First, the prior art teaches that the first probe (capture probe) and second probe (signal probe) *may be* labeled (see column 6, lines 1-67) which indicates that probes could be used with a label or without a label to detect the DNA-RNA hybrid. Second, the independent claims are of the open "comprising" format, which permits the inclusion of additional elements, so that any additional steps are permitted in the claim.

Applicants' particular argument that the prior art does not teach detecting the hybrid complex by binding antibody is fully considered and found not persuasive. Applicants pointed out that the first and second complexing agents of Snitman et al. provide a means to immobilize the probes on to a solid support and Applicants correlate this to column 4, lines 58-67 of the prior art. The issue of immobilization to a solid support is not relevant in the instant context. The detection of target-probe complex is achieved by antigen-antibody binding and not by immobilizing on to a

solid support. Applicants' further argue that the instant claims 22-27 and 30-36 use an antibody *specific* for RNA:DNA complex, which is not recited in the instant claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Therefore the rejection is maintained herein.

New Grounds of Rejections

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

B. Claims 1-5, 10-21, 32, 37-39, and 48 are rejected under 35 U.S.C. 102(e) as being anticipated by Coull et al. (USPN. 6,110,676).

Coull et al. teach a method for detecting a target nucleic acid comprising (a) hybridizing a single-stranded nucleic acid to two or more probes (capture, signal probes, blocker probes) to form a double-stranded hybrids, wherein one of the probes labeled with a detectable moiety, at

least one of the other probes is unlabelled (PNA probe), capturing the hybrid and detecting the hybrid (see column 7, lines 39-67, column 8, lines 1-240, wherein blocker probes suppress nonspecific binding of detectable probes and improve signal to noise ratio (see column 27, lines 44-58, column 35, lines lines 30-50, column 36, lines 1-50). Coull et al. teach that the method could be performed in solution alternatively comprise immobilization of capture probe (see column 7, lines 24-38, column 8, lines 42-65); the hybrid formed comprise nucleic acid/nucleic acid complex (see column 24, lines 31-36). Hybrid complex could be immobilized to a support (see column 16, lines 64-67); method was performed at room temperature (see column 38, lines 37-38); solid support was a streptavidin coated microtiter plate (see column 38, lines 34-53); bound hybrid was detectable by using labeled antibody (alkaline phosphatase labeled) (see column 24, lines 25-54, column 38, lines 34-67, column 39, lines 1-48). Thus the disclosure of Coull et al. meets the limitations in the instant claims.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 6-9, 45-46, 49, and 50-55, are rejected under 35 U.S.C. 103(a) as being unpatentable over Coull et al. (USPN. 6,110,676) and in view of Shah et al. (USPN. 5,629,156).

Coull et al. teach a method for detecting a target nucleic acid comprising (a) hybridizing a single-stranded nucleic acid to two or more probes (capture, signal probes, blocker probes) to form a double-stranded hybrids, wherein one of the probes labeled with a detectable moiety, at least one of the other probes is unlabelled (PNA probe), capturing the hybrid and detecting the hybrid (see column 7, lines 39-67, column 8, lines 1-240, wherein blocker probes suppresses nonspecific binding of detectable probes and improve signal to noise ratio (see column 27, lines 44-58, column 35, lines lines 30-50, column 36, lines 1-50). Coull et al. teach that the method could be performed in solution alternatively comprise immobilization of capture probe (see column 7, lines 24-38, column 8, lines 42-65); the hybrid formed comprise nucleic acid/nucleic acid complex (see column 24, lines 31-36). Hybrid complex could be immobilized to a support (see column 16, lines 64-67); method was performed at room temperature (see column 38, lines 37-38); solid support was a streptavidin coated microtiter plate (see column 38, lines 34-53); bound hybrid was detectable by using labeled antibody (alkaline phosphatase labeled) (see column 24, lines 25-54, column 38, lines 34-67, column 39, lines 1-48). However, Coull et al. did not teach biotinylation of probes on both ends, distance between the probes when hybridized to a target, and bridge probes.

Shah et al. teach a method of detecting a target nucleic acid wherein Shah et al. disclose that the method comprises hybridizing a target nucleic acid (DNA or RNA) to a capture probe

and a detector probe (signal probe), and detecting the bound hybrid (see column 7, lines 17-29, column 3, lines 60-67, column 4, lines 1-51, and column 6, lines 30-57). Shah et al. also teaches immobilization of capture probe on to a solid support (see column 4, lines 29-32); The capture and release using first and second capture probes can be performed in either order (simultaneously or sequentially) (see column 6, lines 58-65). Further Shah et al. teach use of dA-tailed probes (bridge probes) which will bind to both target and dT derivitized supports such that the binding is stronger to the targets than the supports (see column 8, lines 44-54); capture probes biotinylated at both ends (column 9, lines 58-67); the capture probe and the detector probe distance when hybridized to a target comprises less than 3.0kb (see column 9. lines 31-57, see base pair distance of SEQ ID nos.1-4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of detecting a target nucleic acid as taught by Coull et al. with the method of Shah et al. because Shah et al. states that 'dual capture methods are compatible with conventional sandwich hybridization assays, applicable equally well to assays for DNA and RNA targets. Nucleic acid probes and supports are readily be constructed with the binding characteristics required for dual capture", and Shah et al. expressly used such assay to detect DNA-RNA target by constructing bridge probes to lessen background signal noise ratio' (see column 8, lines 15-42). In order to reduce signal to noise ratio in hybridization assays involving DNA-protein interaction, an ordinary practitioner would have been motivated to modify the method of analyzing target DNA by suppressing the unbound detectable probes by blocker probe as taught by Coull et al. by further limiting the background noise in hybridization assay with the inclusion of bridge probes as taught by Shah et al., since an ordinary practitioner

would have known that inclusion of said limitation in hybridization assay would improve sensitivity and specificity of detecting a target nucleic acid which results in better detection method.

Conclusion

No claims are allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suryaprabha Chunduru whose telephone number is 703-305-1004. The examiner can normally be reached on 8.30A.M. - 4.30P.M, Mon - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones can be reached on 703-308-1152. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-0294 for regular communications and - for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

Suryaprabha Chunduru
October 3, 2002

JEFFREY FREDMAN
PRIMARY EXAMINER